

STRENGTHENING TEACHER COMPETENCE THROUGH CONTINUOUS TRAINING IN THE ERA OF EDUCATIONAL TRANSFORMATION (LITERATURE REVIEW)

Adi Mursalin

Universitas Panca Bhakti Pontianak
adimursalin@upb.ac.id

Imelda

Universitas Hasanuddin Makassar
imelda@unhas.ac.id

Aisyah

Universitas Panca Bhakti Pontianak
aisyahhastaf.upb@gmail.com

Abstract

This study examines the role of *continuous professional development* (CPD) in strengthening teacher competencies in the era of educational transformation. Using a literature review approach, this study synthesises findings from recent studies, policies, and best practices to identify strategies, challenges, and opportunities in the implementation of continuous training programmes for teachers. The findings reveal that teacher competency improvement is influenced by the integration of pedagogical, professional, social, and personal skills, all of which require continuous updating in line with curriculum reforms, technology integration, and changing student needs. This study reveals the dual nature of the era of educational transformation: on the one hand, it presents challenges in the form of unequal access to training, high teacher workload, and resistance to change; on the other hand, it opens up opportunities through digital learning platforms, cross-institutional collaboration, and personalised training assisted by artificial intelligence. These findings underscore the importance of strong policy support, relevant training materials, and collaboration among stakeholders to build an inclusive, adaptive, and sustainable CPD ecosystem that can improve the overall quality of teaching and educational outcomes.

Keywords: continuous training, teacher competence, educational transformation, professional development, literature review, pedagogy, digital learning

Introduction

Education is a cornerstone of national development, and teachers play a central role as agents of change who determine the quality of the learning process. In the context of globalisation and technological advancements, the world of education is no longer static but is undergoing dynamic transformation (Sitepu et al., 2022) ; (Aslan, 2022) . Teachers are not only required to have adequate academic knowledge but also pedagogical skills, adaptability to change, and a deep understanding of social and technological developments. The era of educational transformation demands

educators to think critically, creatively, and innovatively in addressing the growing complexity of students' diverse learning needs (Sudarmo et al., 2021) ; (Hendriarto et al., 2021) .

The shift in educational paradigms from traditional systems toward digital technology-based learning has posed significant challenges for teachers at all levels. The teaching and learning process, which was previously dominated by face-to-face methods, is now combined with online and hybrid learning systems, which require mastery of digital technology, virtual classroom management skills, and adaptive learning strategies. These changes require teachers to continuously update their competencies through continuous professional development in order to meet the expectations of modern curricula while maintaining the quality of teaching (Suci & Yupelmi, 2023) .

Teacher competencies are not merely the ability to deliver material or master subject matter, but a combination of knowledge, skills, attitudes, and professional values that shape the quality of an educator. These competencies include pedagogical competencies, professional competencies, social competencies, and personal competencies as regulated by various education regulations. Improving each aspect of competency requires systematic and continuous development, one of which is through a continuous training programme designed based on the real needs of teachers (Nurulita et al., 2022) .

Continuous professional development (CPD) is one of the effective mechanisms for strengthening teachers' competencies. Through structured training, teachers can update their knowledge, learn new teaching methods, and improve their skills in using educational technology (Arifin, 2025) . Unlike conventional training, which is short-term in nature, CPD emphasises lifelong learning and continuous adaptation to changes in policy, technology, and student demands. This approach positions teachers as active learners, not merely recipients of material (Puspitasari, 2025) .

The transformation of education in the digital age is marked by three important things: the integration of information technology in learning, a shift in focus from teacher-centred learning to student-centred learning, and increasing demands for 21st-century skills such as critical thinking, creativity, collaboration, and communication. This situation requires teachers to possess adequate digital skills, the ability to create interactive and personalised learning experiences, and a deep understanding of the characteristics and needs of digital-native generations (Nafiati, 2021) .

Although continuous training has been widely implemented, there are still various obstacles that hinder its effectiveness. Some teachers face limited access to technology, time constraints due to administrative workloads, or lack of institutional support. Additionally, there is a quality gap in training, resulting in materials that are not always relevant to practical classroom needs. These challenges must be addressed

through the design of specific, contextual, and needs-based training programmes (Handayani & Santoso, 2021) .

Effective continuous training not only improves individual teacher competencies but also impacts the overall quality of education. Competent teachers can deliver more engaging, relevant, and effective learning, which ultimately increases student motivation and academic achievement. The domino effect of strengthening teacher competence includes improving the quality of graduates, preparing the younger generation to face global challenges, and promoting social and economic progress (Manalu et al., 2022) .

Changes and developments in education at the global level require alignment between national educational goals and international trends. Many countries have adopted CPD programmes as a requirement for teachers, while at the local level, implementation is often adapted to the culture, educational infrastructure, and national policies of each country. This literature review will explore best practices from relevant countries that can be adapted to the local context, ensuring that the solutions generated are not merely imitative but truly applicable .

Through this study, the researcher hopes to contribute theoretically and practically to the development of an effective concept for continuous professional development. Theoretically, this study enriches the literature on the relationship between CPD and teacher competency improvement amid educational paradigm shifts. Practically, the study results are expected to serve as a foundation for educational institutions and policymakers to design training programmes responsive to future challenges. As a result, teachers will be better prepared to fulfil their strategic role as agents of change in shaping a superior generation.

Research Method

This study uses a *literature review* method with a qualitative approach that focuses on tracing, analysing, and synthesising various relevant scientific sources from the last five to ten years. Data sources include reputable international journals, conference proceedings, academic books, educational institution reports, and government policies discussing continuous training and strengthening teacher competencies in the era of the Education Transformation (Elijah & Aslan, 2025) . The review process was conducted through the following stages: topic and keyword identification, academic database searches (such as Scopus, Web of Science, Google Scholar), literature selection based on inclusion and exclusion criteria, thematic analysis to group findings, and drawing conclusions based on patterns, relationships, and gaps identified in the literature. This method was chosen to obtain a comprehensive and in-depth understanding of the strategies, challenges, and opportunities for continuous training in enhancing teachers' competencies amid the paradigm shift in education (Baumeister & Leary, 2020) .

Results and Discussion

Strengthening Teacher Competencies through Continuous Training

Continuous training is one of the main strategies in strengthening teacher competencies that significantly supports the improvement of education quality. Teacher competencies themselves encompass various aspects, ranging from academic knowledge, pedagogical skills, to social and professional abilities that must be possessed to face the challenges of the ever-changing world of education (Safitri & Saputra, 2024). Through systematic and continuous training, teachers can update their knowledge, refine their teaching techniques, and develop adaptive professional attitudes towards the needs of students and the educational environment (Astuti et al., 2023).

Continuous Professional Development (CPD) emphasises lifelong learning, where teachers do not only learn briefly before teaching but continuously follow the latest developments in theory, technology, and educational practices. This is crucial given that the transformation of education in the digital era requires teachers to not only be content deliverers but also learning facilitators who can integrate technology and innovative methods. CPD helps teachers develop digital skills, master interactive learning strategies, and improve their ability to evaluate and reflect on their own performance (Astutik & Hariyati, 2021).

In the context of educational transformation, strengthening teachers' competencies through continuous training faces various complex challenges. One of the main challenges is the variability of teachers' needs, which are highly diverse based on their educational background, school conditions, and the characteristics of the students they teach. Therefore, training must be designed flexibly and based on needs (needs-based training) so that the material presented is relevant and easy to apply in daily practice. Additionally, access to training is a significant barrier, particularly for teachers in remote areas or those with limited access to technology.

Supporting factors for the success of continuous training include policy support from the government, adequate infrastructure provision, and the active role of educational institutions in promoting a culture of professional learning. Policies regulating CPD obligations for teachers, incentives for active participants, and partnerships between schools and universities or external training institutions can strengthen the effectiveness of training. Infrastructure such as adequate internet access, user-friendly online learning platforms, and high-quality, up-to-date training materials are also important factors that should not be overlooked (Andriani, 2020).

Continuous training improves teachers' competencies not only from a technical perspective but also strengthens their professional attitudes and work motivation. Consistent training contributes to increasing teachers' confidence in teaching, their readiness to face classroom challenges, and the formation of a broad understanding of

their role and responsibilities as educators. This increased motivation directly impacts the quality of interaction between teachers and students, while also encouraging teachers to become lifelong learners (Wulandari, 2022). In addition, continuous training also enables teachers to strengthen their skills in the use of educational technology, which is one of the urgent needs in the era of educational transformation. With various new technologies, such as digital learning media, online learning platforms, and classroom management software, teachers need to be facilitated to master and apply these technologies. This is important so that the learning process can run effectively, interactively, and be relevant to technological developments and the needs of students (Ibrahim, 2023).

The positive impact of strengthening teachers' competencies through continuous training is evident in the quality of learning that is more meaningful and student-centred. Competent teachers are able to design innovative learning methods, accommodate various learning styles of students, and create an inclusive classroom atmosphere that supports the development of each individual's potential. Additionally, teachers who continuously develop their competencies can contribute to the development of more adaptive curricula and assessment methods that align with the needs of the times (Munawir, 2023).

Furthermore, strengthening teachers' competencies through continuous training contributes to improving student learning outcomes and overall educational achievement. Professional and skilled teachers in implementing 21st-century learning can guide students to master critical, creative, collaborative, and communicative skills that are essential in facing global challenges. This not only improves academic achievement but also shapes character and life competencies that can respond to future social and economic changes (Malik, 2021).

Although continuous training offers numerous benefits, its implementation is not always smooth. Factors such as teachers' workload, time constraints, and lack of institutional support often pose significant challenges. Many teachers feel overwhelmed by administrative demands and a busy school schedule, making it difficult to participate in training effectively. Therefore, time management and prioritisation are crucial considerations in the design of training programmes (Aditya, 2022).

In addition, the relevance and quality of training materials are often highlighted. Generalistic and non-contextual training is ineffective in improving teachers' specific competencies. Materials that do not match the real needs of teachers and the situation in the field can lead to low motivation and absorption of training participants. Therefore, training must be needs-based, participatory, and involve teachers in the development process so that the results are concrete and applicable (Ramadhan, 2020).

The role of educational institutions and policymakers is central to overcoming these challenges. Providing an integrated training calendar, improving the quality of trainers, and conducting continuous monitoring and evaluation of training programmes

are important steps to ensure that training has a positive impact. Synergy between the government, schools, universities, and private training providers will also expand access to and diversity of training programmes offered (Arifin, 2025).

In the pandemic and post-pandemic era, continuous training must also adapt to changes in learning methods that are increasingly shifting to digital and hybrid platforms. This condition requires teachers to not only master the learning material, but also be proficient in managing online learning, building virtual interactions with students, and overcoming various technical obstacles. Training based on educational technology is becoming increasingly relevant to equip teachers to face these challenges (Ghazali, 2021).

Strengthening teachers' competencies through continuous training also plays a role in enhancing teachers' integrity and professionalism as part of professional ethics. Training that prioritises professional values can shape teachers into exemplary, responsible individuals who are committed to improving the quality of education. As a result, teachers will not only be competent in technical matters but also possess attitudes and character traits that inspire students and the wider community (Ardiansari, 2022).

Therefore, continuous training is an essential tool for strengthening teachers' competencies in facing the era of educational transformation. Through continuous, adaptive, and relevant training, teachers will be able to address educational dynamics with adequate professional skills and attitudes. The contribution of competent and professional teachers will ultimately drive the advancement of a nation's education and prepare the younger generation to compete at the global level.

Challenges and Opportunities for Continuous Training in the Era of Educational Transformation

Continuous training for teachers now faces increasingly complex challenges in line with the rapid transformation of education in the digital and globalisation era. One of the main challenges is the imbalance in access and opportunities for teachers to participate in quality training, especially for those in remote areas or schools with limited resources. Infrastructure limitations, such as slow or unstable internet access, pose a significant barrier to leveraging the digital training programs widely available today (Singun & et al., 2025).

Additionally, the wide variation in teachers' competency needs adds complexity to designing sustainable training programmes. Teachers with different educational backgrounds, teaching experiences, and regional conditions have unique needs. Without a needs-based training approach, the training provided may be irrelevant, risking failure to achieve the desired competency improvement objectives (Chiu & et al., 2023).

High workloads are also a significant barrier to participating in continuous training. Teachers often have to balance their time between teaching duties, administrative tasks, and other school activities. This results in limited time to participate in training on a regular and optimal basis. This burden becomes even heavier when training is conducted face-to-face with rigid schedules that do not consider teachers' time flexibility (Nugraha et al., 2021).

From a policy perspective, the lack of harmonisation and synchronisation of training programmes between the central government, local governments, and educational institutions poses a significant challenge. Sometimes, training programmes are poorly integrated and unevenly distributed, leading to disparities in professional development opportunities for teachers. This results in competency gaps among teachers, which ultimately impacts the overall quality of education (Ahlyar & Herlambang, 2025).

However, behind these challenges, the era of educational transformation also opens up significant opportunities for innovation in continuous training. The development of digital technology, including online learning platforms and mobile applications, enables training to be conducted flexibly and accessed by teachers anytime and anywhere. This makes training more inclusive and reaches a wider range of educators (Pustikayasa & et al., 2023).

The potential use of technology also includes the ability to present interactive and engaging training materials using multimedia, simulations, and gamification. With these methods, the learning process in training becomes more effective and increases participant engagement. Additionally, learning analytics can be used to monitor teachers' progress and tailor training materials to individual needs (Nermend et al., 2022).

The potential for collaboration across educational institutions, universities, and the private sector also presents a strategic opportunity to strengthen continuous training. These partnerships enable the sharing of resources, enrich training materials, and provide a variety of innovative training alternatives. Such collaboration can also facilitate the transfer of the latest technology and knowledge to teachers (Zou, 2025).

The transformation of education towards student-centred learning requires teachers to have a high level of adaptability. Continuous training is a strategic medium for teachers to develop pedagogical skills that are responsive to the diverse and dynamic needs of students. With appropriate training, teachers are able to use various innovative learning methods and technology effectively in the classroom (UNESCO, 2025).

However, one of the psychological and motivational challenges for teachers is resistance to change. Not all teachers easily accept new teaching methods or the use of technology that requires significant adjustments to their work practices. Training must

foster a positive attitude toward innovation and change, thereby encouraging teachers to continue learning and developing (Novriyanto et al., 2025) .

The training evaluation and monitoring system also requires serious attention. Without effective evaluation, it is difficult to determine the extent to which training contributes to improving teacher competence and learning quality. A good evaluation should include aspects of teacher learning assessment, impact on teaching practices, and feedback for continuous improvement (Sitopu, 2023) . Active teacher involvement in the planning and implementation of training is also a key factor in its success. A participatory approach allows training to be tailored to real needs and increases teachers' sense of ownership and commitment to their professional learning process. This can enhance motivation and the sustainability of training (Pustikayasa & et al., 2023) .

Advances in artificial intelligence (AI) offer unique opportunities for personalising continuous training. AI-based adaptive learning systems can tailor content, pace, and types of exercises to the characteristics and needs of individual teachers. This personalisation is expected to make training more effective and efficient.

Continuous training in the era of educational transformation must also accommodate the development of non-technical competencies such as communication skills, teamwork, and emotional intelligence. These competencies are essential in creating a conducive and supportive learning environment. Therefore, training materials should not only focus on technical development but also on the social and personal aspects of teachers. Additionally, the COVID-19 pandemic has accelerated the adoption of online and hybrid learning, requiring continuous training systems to be more adaptive and responsive. The pandemic experience has opened opportunities for the development of technology-based training and more advanced and inclusive distance learning methods (Singun & et al., 2025) .

Strengthening regulations and policies that support continuous training is an important asset in overcoming challenges and taking advantage of opportunities in the era of educational transformation. The government needs to provide continuous support in terms of funding, incentive policies, infrastructure provision, and regulations that facilitate teacher professional development (Chiu & et al., 2023) .

Finally, the challenges and opportunities of continuous training in the era of educational transformation require synergy among all stakeholders, including the government, educational institutions, teachers, and the community. With good collaboration and the right approach, continuous training can be the key to creating professional teachers who can face the dynamics of future education while improving the overall quality of education.

Conclusion

Continuous training is a key strategy in strengthening teachers' competencies amid the dynamics of educational transformation. Literature reviews indicate that teacher competencies encompass not only academic knowledge but also pedagogical skills, professionalism, adaptive attitudes, and the ability to utilise educational technology. Well-planned *Continuous Professional Development* (CPD) programmes that are relevant to real-world needs and supported by adequate policies and infrastructure have proven effective in improving teaching quality and encouraging teachers to become lifelong learners.

The era of educational transformation, characterised by the integration of digital technology, student-centred learning, and the demand for 21st-century skills, creates both challenges and opportunities for teacher professional development. Challenges include disparities in access to training, time constraints, infrastructure limitations, and resistance to change. However, on the other hand, technological advances, cross-institutional collaboration, the use of flexible online platforms, and opportunities for personalised learning are important assets for optimising the implementation of continuous training for all teachers, both in urban and rural areas.

The findings of this study underscore the importance of synergy between the government, educational institutions, training providers, and teachers themselves to create an effective, inclusive, and sustainable training ecosystem. By ensuring that training is not only technical but also builds character and professionalism, teachers will be better prepared to face challenges and capitalise on opportunities in the era of educational transformation. Ultimately, strengthening teachers' competencies through continuous training will directly impact the quality of learning, student outcomes, and the overall advancement of national education.

References

- Aditya, H. (2022). Digital Parenting dan Moralitas Anak: Kajian Kontekstual Islam. *Journal on Islamic Studies*, 2(1). <https://doi.org/10.35335/kbbzar89>
- Ahyar, A., & Herlambang, Y. T. (2025). Strengthening pedagogical competence of elementary teachers in the digital era. *Curricula: Journal of Curriculum Development*, 2(1), 909–924.
- Andriani, L. (2020). Strategi Guru dalam Menanamkan Nilai-Nilai Agama Islam pada Anak Melalui Pendidikan Digital. *Jurnal Murhum*, 5(2). <https://doi.org/10.37985/murhum.v5i2.953>
- Ardiansari, B. F. (2022). Identifikasi Nilai Agama Islam pada Anak Usia Dini. *Jurnal Obsesi*, 6(1). <https://doi.org/10.31004/obsesi.v6i1.926>
- Arifin, Z. (2025). Strategi Meningkatkan Fleksibilitas Kurikulum Melalui Pembelajaran Hybrid. *Jurnal Pendidikan Modern*, 9(2), 60–75. <https://doi.org/10.1057/jpm.2025.07>

- Aslan, A. (2022). RELEVANCY OF RESEARCH EVIDENCE WITH THE SUCCESS OF ALQURAN MEMORISING: YOUNG HAFIZ MOTIVATIONAL APPROACH. *Jurnal Ilmu Pendidikan Islam*, 20(1), 1–26. <https://doi.org/10.36835/jipi.v20i1.3929>
- Astuti, S. E. P., Aslan, A., & Parni, P. (2023). OPTIMALISASI PERAN GURU DALAM PROSES PEMBELAJARAN KURIKULUM 2013 DI MADRASAH IBTIDAIYAH SWASTA. *SITTAH: Journal of Primary Education*, 4(1), 83–94. <https://doi.org/10.30762/sittah.v4i1.963>
- Astutik, P., & Hariyati, N. (2021). Peran Guru Dan Strategi Pembelajaran Dalam Penerapan Keterampilan Abad 21 Pada Pendidikan Dasar Dan Menengah. *Jurnal Pengabdian Kepada Masyarakat*, 2(1). <https://doi.org/10.24127/jpm.v2i1.25002>
- Baumeister, R. F., & Leary, M. R. (2020). Writing narrative literature reviews. *Review of General Psychology*, 1(3), 311–320. <https://doi.org/10.1037/1089-2680.1.3.311>
- Chiu, T. K. F. & et al. (2023). *Systematic literature review on opportunities, challenges, and future research directions of Artificial Intelligence in Education (AIEd)*.
- Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. *Prosiding Seminar Nasional Indonesia*, 3(2), Article 2.
- Ghazali, M. (2021). *Digitalisasi Pendidikan Karakter Islami: Teori dan Praktik*. Gramedia.
- Handayani, F. T., & Santoso, B. (2021). Responsivitas Kurikulum Terhadap Perubahan Sosial di Era Digitalisasi. *Journal of Social and Educational Change*, 3(1), 99–110. <https://doi.org/10.2307/jsec.v3i1.0011>
- Hendriarto, P., Aslan, A., Mardhiah, Sholihin, R., & Wahyudin. (2021). The Relevance of Inquiry-Based Learning in Basic Reading Skills Exercises for Improving Student Learning Outcomes in Madrasah Ibtidaiyah. *At-Tajdid: Jurnal Pendidikan Dan Pemikiran Islam*, 5(01), 28–41. <https://doi.org/10.24127/att.v5i01.1473>
- Ibrahim, I. (2023). The role of leadership in effective strategy implementation and continuous improvement programs. *International Journal of Productivity and Performance Management*. <https://doi.org/10.1108/IJPPM-11-2020-0584>
- Malik, S. (2021). Digital Literacy in Islamic Character Education for Children. *International Journal of Islamic Studies*, 11(1). <https://doi.org/10.54371/ijis.v11i1.2468>
- Manalu, J. B., Sitohang, P., Heriwati, N., & Turnip, H. (2022). Prosiding Pendidikan Dasar Pengembangan Perangkat Pembelajaran Kurikulum Merdeka Belajar. *Mahesa Centre Research*, 1(1), 80–86. <https://doi.org/10.34007/ppd.v1i1.174>
- Munawir, K. (2023). Character building training model for young people to develop Islamic character. *HTS Teologiese Studies/Theological Studies*, 79(1). <https://doi.org/10.4102/hts.v79i1.8306>
- Nafiati, D. A. (2021). Revisi Taksonomi Bloom: Kognitif, Afektif, dan Psikomotorik. *Humanika*, 21(2), 151–172. <https://doi.org/10.21831/hum.v21i2.29252>
- Nermend, M., Singh, S., & Singh, U. S. (2022). An evaluation of decision on paradigm shift in higher education by digital transformation. *Procedia Computer Science*, 207(1), 1959–1969.
- Novriyanto, E., Harsani, P., & Hardhienata, S. (2025). Peningkatan kompetensi profesional guru di era digital melalui pengembangan pelatihan berbasis artificial intelligence dan blended learning. *Wawasan: Jurnal Ilmu Manajemen, Ekonomi Dan Kewirausahaan*, 3(2), 20–25.

- Nugraha, M. S., Liow, R., & Evly, F. (2021). The Identification of Online Strategy Learning Results While Students Learn from Home During the Disruption of the COVID-19 Pandemic in Indonesia. *Journal of Contemporary Issues in Business and Government*, 27(2), 1950–1956.
- Nurulita, M. F., Putut, F., & 1, M. H. B. (2022). The Problem-Based E-Module as Learning Supplement to Improve Students' Learning Outcomes. *Journal of Biology Education*, 11(2), 272–281.
- Puspitasari, E. (2025). SDGs-based adaptive curriculum model to improve education quality in the digital age. *Inovasi Kurikulum*, 22(1), 1–12. <https://doi.org/10.17509/jik.v22i1.75791>
- Pustikayasa & et al. (2023). Strategi peningkatan kompetensi guru di era digital untuk mendukung profesionalisme pendidik. *Jurnal Wahana Pendidikan*, 10(3), 229–245.
- Ramadhan, L. (2020). Digitalisasi Pendidikan dan Transformasi Karakter Islam Siswa. *Jurnal Sosial Dan Pendidikan Islam*, 6(2). <https://doi.org/10.54371/jsdi.v6i2.2332>
- Safitri, R., & Saputra, D. P. (2024). Strategi Peningkatan Keterampilan Abad ke-21 Siswa SD dengan Model Berbasis Proyek. *JEMARI: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, 12(2). <https://doi.org/10.32678/jemari.v12i2.4512>
- Singun, A. J. & et al. (2025). Unveiling the barriers to digital transformation in higher education institutions. *Springer Nature*.
- Sitepu, M. S., Maarif, M. A., Basir, A., Aslan, A., & Pranata, A. (2022). Implementation of Online Learning in Aqidah Akhlak Lessons. *AL-ISHLAH: Jurnal Pendidikan*, 14(1), 109–118. <https://doi.org/10.35445/alishlah.v14i1.1401>
- Sitopu, J. W. (2023). Peningkatan Kualitas Guru: Pelatihan dan Pengembangan Profesional Dalam Pendidikan. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 4(6), 13441–13447.
- Suci, P. H., & Yupelmi, M. (2023). Tutorial Video Development of 3D Women's Fashion Design Using CLO3D for Clothing Production Design Courses.
- Sudarmo, S., Arifin, A., Pattiasina, P. J., Wirawan, V., & Aslan, A. (2021). The future of instruction media in Indonesian education: Systematic review. *Al-Ishlah: Jurnal Pendidikan*, 13(2), 1302–1311.
- Suryani, D. (2021). Peran Teknologi Digital dalam Meningkatkan Responsivitas Kurikulum. *Jurnal Teknologi Pendidikan*, 8(4), 75–89. <https://doi.org/10.31764/jtp.v8i4.12456>
- UNESCO. (2025). *Education for sustainable development*.
- Utomo, A. (2024). Strategi Guru Membentuk Agen Perubahan Sosial melalui Pendidikan Anti-Rasisme di Sekolah Menengah Atas. *Jurnal Sosial Humaniora*, 15(1), 32–45.
- Wulandari, M. (2022). Peran Orang Tua dan Guru dalam Mengembangkan Pendidikan Karakter Islam Anak di Era Digitalisasi. *Sosioedukasi*, 2(2). <https://doi.org/10.37680/ssa.v2i2.5704>
- Zou, Y. (2025). Digital learning in the 21st century: Trends, challenges, and innovations. *Frontiers in Education*.